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Soil Disturbance Standards

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In order to provide quantitative standards for defining the limits of acceptable rutting as required by FSC CAR 2004.4, the Department is proposing the following standards. The Department's intent is to include these standards in a DNR Forestry Handbook. The standards would be used on timber sales on state forests and apply to forest roads, landings, skid trails, and the general harvest area.

Additional materials are also being developed to compliment the standards and to provide information on how to avoid unintentional soil disturbances, such as soil compaction, gullies, and ruts, and how to correct problems if they occur. Background information on research regarding the impacts of soil disturbances on forest productivity would also be included.

The standards in the handbook should be used in conjunction with on-site visits and in consultation with timber sale contractors and on-site equipment operators. Together, this information should guide decisions made by timber sale administrators and by timber sale contractors, but it does not mandate decisions. On-the-ground conditions and availability of equipment and other resources should also be considered.

Goals for the management of soil disturbances are to:

- Minimize inadvertent soil disturbances during timber harvests and potential adverse impacts to soil productivity, water quality, fish and wildlife habitat, and other natural resources.
- Protect public investment in state forests.
- Maintain roads and related structures to intended design standards.
- Combine professional level expertise and operator experience in the formation of on-the-ground decisions.
- Provide a protocol for identifying and responding to maintenance needs.

The Department recognizes that soil disturbances occur during forestry operations. Some disturbances are intentional, such as mechanical site preparation to facilitate the planting of tree seedlings and encourage natural regeneration. Other soil disturbances are unintentional, such as ruts or gullies in a skid trail, and may result in tree mortality, reduced forest soil productivity, and reduced water quality in lakes, rivers, and wetlands. Ruts and other soil disturbances can also visually suggest poor stewardship, even if forest productivity or water quality is not impacted.

Soil disturbances during timber sales can be avoided or minimized by using appropriate equipment, by avoiding forestry operations on susceptible sites during wet periods, and by carefully monitoring and controlling operations. If they do occur, the potentially negative effects of soil disturbances can be mitigated to varying degrees by remedial actions such as reestablishing drainage patterns or installing erosion controls. Repair and mitigation, however, is less desirable than avoidance because of the cost of implementing and maintaining repair and

mitigation practices, the loss of forest productivity until repair or mitigation occurs, and the possibility that the soil degradation may not be able to be corrected.

Areas with "excessive" levels of soil disturbances display degradation due to poor site conditions or excessive use. To avoid reaching excessive levels of soil disturbances and to avoid disruption in timber sale activities, the following actions may be taken:

- Identify areas susceptible to soil disturbances and plan activities accordingly.
- Operate equipment only when ground is frozen or dry enough to support the load.
- Monitor air temperature. As air temperatures rise above freezing, equipment may be able to operate only in the early morning. Soil frost begins to disappear after night temperatures stay above freezing for three or four days.
- Avoid sharp turns with loaded equipment, especially at the base of hills.
- Avoid traveling through depressions.
- Operate on slash mats.
- Shift harvest operations to upland areas of a timber sale.
- Reduce loads carried by logging equipment.
- Use low ground pressure equipment.

Even if the actions outlined above are followed, in some instances, soil disturbances will still occur. To determine if the soil disturbances have reached excessive levels, please refer to Table 1.

Table 1. Level of Soil Disturbance

Timber Sale Component	Soil disturbances are excessive if:	Management Recommendation
Anywhere in Timber Sale	▪ A gully or rut is a minimum of 6 inches deep and is resulting in channelized flow to a wetland, stream, or lake.	As soon as weather conditions allow, install erosion control practices and stabilize site.
Roads and Landings	▪ In a riparian management zone (RMZ) or wetland, a gully or rut is a minimum of 6 inches deep and a minimum of 25 feet long. ▪ In an upland area (outside of RMZ), a gully or rut is a minimum of 10 inches deep and a minimum of 25 feet long.	Repair site, including seeding site and installing drainage and erosion control practices, as needed.
Skid Trails	▪ Gully or rut is a minimum of 6 inches deep and a minimum of 25 feet long.	Move activities to different area of sale and repair site.
General Harvest Area	▪ Gully or rut is a minimum of 6 inches deep.	Move activities to different area of sale and repair site.

A gully is an erosion channel cut into the soil along a line of water flow.

A rut is an elongated depression in a trail or roadway caused by dragged logs or by wheels or tracks of harvesting machinery and often exacerbated by erosion from uncontrolled storm water runoff.

If soils disturbances occur, regardless of whether they reach excessive levels or not, corrective maintenance should be completed as soon as weather and soil conditions allow. If there is a delay in fully implementing site repairs, erosion control practices should be installed as soon as possible to stabilize the soil and prevent erosion until the site can be fully repaired.

If site conditions are too wet or too soft, activities may need to be shifted to different areas of a timber sale, or potentially suspended, until sites conditions improve. When determining whether activity at a timber sale should be suspended, the timber sale administrator should consult with the contractor; however, the final decision is the responsibility of the timber sale administrator. The contractor is encouraged to voluntarily suspend activities if they determine that weather conditions have become too warm or too wet to safely operate in an area.

In general, there is flexibility in determining whether a timber sale should be suspended because the logger may have different equipment or other options available to limit further damage. Including loggers in these discussions can often help find solutions to management issues. Regardless of whether the final decision is to suspend a timber sale, erosion controls should be installed as soon as possible to prevent any further erosion or sedimentation.